

SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 3 is found in claim 17 as originally presented and on page 32, Polymer A in the specification. No new matter would be added to this application by entry of this amendment. No new issues would be raised by entry of applicants' amendment as applicants are merely introducing the limitations of a dependent claim into the independent claim. Entry of applicants' amendment and full consideration thereof at this stage of prosecution is respectfully requested.

Upon entry of the amendment, claims 3 and 12-16 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a method of antifouling and washing hard surfaces.

In the claimed invention, re-deposition of fouling, very often observed in toilet bowls, can be prevented, even with washing several times, with maintenance by initial antifouling. In particular, toilet bowl surfaces are treated with an antifouling detergent composition comprising a polymer having a specific monomer ratio. Such a monomer ratio based polymer is advantageous and provides for the prevention of the re-deposition.

The references of record do not describe or suggest such a method of antifouling and washing hard surfaces of *toilet bowls*.

The rejections of claims 3 and 12-17 under 35 U.S.C. § 103(a) over various combinations of Pucci et al U.S. 5,872,088, Aubay et al. U.S. 6,703,358 and Aubay et al. U.S. 6,593,288 are respectfully traversed.

None of Pucci et al or Aubay et al. U.S. '358 describe a polymer in which the amine containing monomer has two alkylene groups $R^1R^2C=C(R^3)-X-$, as claimed. According to Aubay et al. U.S. '358, each group R_2 , R_3 and R_4 of formula (I) is a linear or branched C_{1-4} alkyl group. A second polymerizable alkylene group is not suggested.

Aubay et al. U.S. '288, generally describes polymer compositions in which the ratio of amine monomer (a) to hydrophilic monomer (b) is 50/50 to 10/90 (column 4, lines 28-29) A composition having a ratio of $A/A+B$ of 2/3 to 0.9 is not suggested in this reference.

In contrast, the claimed invention is directed to a method of antifouling and washing in which the polymer is a copolymer of a quaternized amine monomer (A) having at least two alkylene groups and a second polymerizable monomer (B) in which the ratio of monomer (A)/monomer (A) + monomer (B) is from 2/3 to 0.9. Applicants note that the claims have been amended to reflect such a compositional requirement.

As the only reference which describes a polymer having two alkylene groups does so in a ratio which does not exceed 50/50 (0.5), the claimed method using a polymer in which the $A/A+B$ ratio is 2/3 (0.666) to 0.9 is not *prima facie* obvious. The claim limitation of an $A/A+B$ ratio of 2/3 to 0.9 is not suggested in the cited references.

Moreover, applicants have discovered an improved antifouling property when the ratio is as claimed, as compared with when the ratio of $A/A+B$ is only 0.5.

As evidence of the improved anti-fouling properties when using a polymer as claimed, applicants enclose herewith the declaration of Mr. Yosuke Komatsu, a named inventor of the above-identified application.

Mr. Komatsu prepared further polymer samples and tested same as in example 2 of the above-identified application.

The Komatsu declaration provides additional comparison of antifouling performance of polymer F, a 50/50 mixture of diallyldimethylammonium chloride/maleic acid copolymer

having a weight average molecular weight of 20,000 with antifouling performance of polymers A and B, each with a 2/3 ratio of diallyldimethylammonium chloride to maleic acid. For the examiner's convenience the data from the Komatsu declaration is reproduced below:

Table 2-1

			Present invention products								Comparative products			
			2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-1	2-2	2-3
Concentration of slowing liquid (ppm)	Polymer A		1.0	1.0	1.0	1.0					0.5			
	Polymer B						0.5	1.0	ED	2.0				
	Polymer C											0.5		
	Polymer D												0.5	
	Polymer E													0.5
	Polymer F													0.5
	Surfactant A		1.0											
	Surfactant B			1.0										
	Surfactant C				1.0	0.5	0.5	0.5	1.0					
	Surfactant E				5.0					3.0				
	Ethylene glycol		2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Antifouling performance	After 2 months	front region	○	○	○	⊙	△	⊙	⊙	⊙	×	○	△	○
		water-line region	○	⊙	⊙	⊙	⊙	⊙	⊙	⊙	×	△	△	△
		water-sealed region	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	△	×	×	○

Polymer F : Diallyldimethylammonium chloride/maleic acid/sulfur dioxide (molar ratio 20/30/40) copolymer, a weight-average molecular weight=20,000

Comparative product 2-5, formulated with a polymer having an A/A+B ratio of only 0.5 produced inferior anti-fouling performance relative to inventive product 2-9, a formulation having an A/A+B ratio of 2/3, at the same concentration of polymer. Inventive products 2-1 to 2-8 further demonstrate superior anti-fouling performance when the A/A+B ratio is from 2/3 to 0.9.

As applicants have discovered a ratio of quaternized amine monomer to second polymerizable monomer which provides improved antifouling performance, the claimed invention is clearly not obvious over the cited references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Applicants note that on page 11 of the official action the examiner questions whether comparative product 1-1 is within the scope of the claimed invention. Applicants note that the polymer has a weight average molecular weight of 1,700,000, a molecular weight in excess of the claim limitation of only 5,000 to 60,000. Thus, comparative product 1-1 is clearly outside of the scope of the claimed invention.

The rejection of claim 17 under 35 U.S.C. 112, first paragraph is respectfully traversed.

Applicants wish to direct the examiner's attention to page 32 of the specification, Polymer A in which a 2/1 ratio of diallyldimethylammonium chloride/maleic acid is illustrated. As such those of ordinary skill in the art would readily appreciate that applicants were in possession of the invention in which the ratio of monomer A to monomer A+B was 2/3-0.9. this narrow range of 0.666 to 0.9 was clearly envisioned by applicants, especially in view of the broader disclosure of 0.5 to 0.9. In view of this clarification, withdrawal of this ground of rejection is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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